

1.  $\int (x^3 - 2) dx$

$$\underline{\underline{\frac{1}{4}x^4 - 2x + C}}$$

2.  $\int \left( x^{\frac{3}{2}} + 4x + 1 \right) dx$

$$\underline{\underline{\frac{2}{5}x^{5/2} + 2x^2 + x + C}}$$

3.  $\int (\sqrt[3]{x^2} - 1) dx$

$$\underline{\underline{\frac{3}{5}x^{5/3} - x + C}}$$

4.  $\int \frac{1}{x^4} dx$

$$\underline{\underline{-\frac{1}{3x^3} + C}}$$

5.  $\int \frac{x-3}{\sqrt{x}} dx \Rightarrow \int (x^{1/2} - 3x^{-1/2}) dx$

$$\underline{\underline{\frac{2}{3}x^{3/2} - 6x^{1/2} + C}}$$

6.  $\int (y+3)y^2 dy \Rightarrow \int (y^3 + 3y^2) dy$

$$\underline{\underline{\frac{1}{4}y^4 + y^3 + C}}$$

$$\begin{aligned}
 15. \quad f'(x) &= \frac{1}{\sqrt{x}}; f(0) = 3 \\
 \int dy &= \int x^{-1/2} dx \\
 y &= 2x^{1/2} + C \\
 f(0) &= 3 = C \\
 \underline{\underline{f(x) = 2\sqrt{x} + 3}}
 \end{aligned}$$

$$\begin{aligned}
 16. \quad f'(x) &= 6x^2 + 4x; f(1) = -1 \\
 \int dy &= \int (6x^2 + 4x) dx \\
 y &= 2x^3 + 2x^2 + C \\
 f(1) &: -1 = 2 + 2 + C \\
 C &= -5 \\
 \underline{\underline{f(x) = 2x^3 + 2x^2 - 5}}
 \end{aligned}$$

$$\begin{aligned}
 17. \quad f''(x) &= 4; f'(3) = 7; f(3) = -1 \\
 f'(x) &= \int 4 dx \\
 f'(x) &= 4x + C_1 \\
 f'(3) &: 7 = 12 + C_1 \\
 C_1 &= -5 \\
 f(x) &= \int (4x - 5) dx \\
 f(x) &= 2x^2 - 5x + C_2 \\
 f(3) &: -1 = 18 - 15 + C_2 \\
 C_2 &= -4 \\
 \underline{\underline{f(x) = 2x^2 - 5x - 4}}
 \end{aligned}$$

$$\begin{aligned}
 18. \quad s''(t) &= -32; s'(0) = 58; s(0) = 92 \\
 s'(t) &= \int (-32) dt \\
 s'(t) &= -32t + C_1 \\
 C_1 &= 58 \\
 s(t) &= \int (-32t + 58) dt \\
 s(t) &= -16t^2 + 58t + C_2 \\
 C_2 &= 92 \\
 \underline{\underline{s(t) = -16t^2 + 58t + 92}}
 \end{aligned}$$